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ON THE RESEARCH POTENTIAL OF DATA DRAWN FROM THE GENERAL WELFARE ASSISTANCE PROGRAM ONTARIO 1980-1982

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1. Introduction

While a significant amount of research has been carried out studying unemployment durations, considerably less work has been carried out on welfare duration. Indeed, to the best of our knowledge, no work has been carried out using micro data for either Ontario or Canada. To rectify this situation, with the co-operation of the Ministry of Community and Social Services, we collected a data set on participants in Ontario's General Welfare Assistance (GWA) Program for the years 1980-1982. Funding to cover the cost of this data collection was provided by both the Ontario Economic Council and the Social Science and Humanities Research Council of Canada. We have begun preliminary analysis of our data, and in this report we outline our assessment of the research potential of the data. In Section 2, we provide an overview of our proposed methodology for analyzing welfare data. In Section 3, we investigate the research potential of our data, given this methodological background.

2. Methodology

We intend to adopt standard econometric techniques in analyzing welfare duration. These techniques have been widely used in analyzing unemployment duration; see, for example, Flinn and Heckman (1982), Ham and Rea (1984), Heckman and Singer (1984), Lancaster (1979), Narendranathan, Nickell and Stern (1983), Nickell (1979) and Solon (1984). This brief survey is not intended to provide a rigorous statistical description of these models but rather to aid in obtaining and intuitive understanding of the principles involved.

The starting point for these techniques is the (conditional) probability that an individual leaves GWA in a small time interval, Δt (for example, a day), given that the individual has been in the welfare program for k time units (or days). This conditional probability of leaving welfare may be denoted by $\theta(k)\Delta t$, and is usually assumed to depend on the length of time in the program (k), welfare benefits, economic conditions such as the local unemployment rate, and demographic variables such as sex, age, and education. Given an estimate of $\theta(k)$, one can examine how the probability of leaving welfare varies with length of time in program, or how changes in benefits affect expected duration in the program. (See, for example, Nickell (1979)). The goal, then, is to estimate the conditional probability of $\theta(k)$. To see how one could do this, consider the following example. Suppose that the conditional probability of an individual leaving welfare in a day, given that he has been in the program k days, takes the logistic form:

$$(1) \qquad \theta(k) = 1 / (1 + \exp(-\beta' X_k)) ,$$

where β is the vector of parameters and X_k is a vector of independent variables such as duration, (k), benefits, age, etc. The probability of not leaving on that day is $1 - \theta(k)$. Suppose a given individual i spends t_i days in the GWA program. (He leaves the program on day t_i.) The (unconditional) probability of this occurring is the conditional probability that he does not leave in any of the first $(t_i - 1)$ days, multiplied by the conditional probability that he leaves on the t_i^{th} day. Formally, this probability may be written:

$$P_i(t_i) = (1 - \theta_i(1)) \times (1 - \theta_i(2)) \times \cdots \times (1 - \theta_i(t_i - 1) \times \theta_i(t_i) \; . \tag{2}$$

Given data on the length of time N individuals spend on GWA, we can form a likelihood function

$$L = P_1(t_1) \times P_2(t_2) \times \ldots\ldots \times P_N(t_N) \; , \tag{3}$$

where, for example, t_2 is length of time the second individual spends in GWA, and $P_2(\cdot)$ is calculated from equation (2) using that individual's X variables in the expression for θ given by (1). The goal is to estimate β , and one can chose the value of β which maximizes the value of the likelihood function (3) for our sample. This will be the maximum likelihood estimator of β , which has very desirable statistical properties.

Given an estimate of β , one can use (1) to calculate how this conditional probability of leaving welfare changes as the length of the spell increases, or how the expected duration on GWA changes as benefits or unemployment rates change.[1]

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[1] The functional form (1) was previously used by Nickell (1979) and Ham and Rea (1984). In practice, a variety of functional forms for (1) will be used to check the robustness of the results.

3. Data

Since we are interested in examining the impact of economic variables on welfare duration, in our preliminary data analysis we analyzed a subset of GWA participants who satisfied the following criterion:

1. The individual was a employable male born in 1946 or later.
2. The individual had never married and was not currently living in a common-law relationship.
3. The individual was receiving assistance because he had been unable to obtain regular employment, and was currently unemployed because he had quit, was fired from, or was laid off from his previous job.

The above critera were used to obtain a sample for which duration in GWA most closely resembled unemployment duration.

For the purposes of this report, we have separated the data by the year the spell started, and also into complete and incomplete spells. A complete spell is defined as one that ended in the year that it started, while an incomplete spell is one that ended in a later year.[2] The number of spells for each year is given in Table 1. (All of the tables have been placed at the end of the study.) For the statistical analysis described in Section 2, there are two important facts contained

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[2] For the statistical analysis described in Section 2, this distinction is largely irrelevant, since even if a spell overlaps two years, we can obtain all the necessary information on the spell.

in Table 1. First, we have over 8,000 spells on GWA for our analysis, and this sample size compares very favourably with the samples used in previous studies. Secondly, each of the three years contributes a significant number of observations, which in turn should allow for considerable time-series variation in local labour market conditions and the real value of benefits.[3]

We also have a substantial variation in the other independent variables, age and education, that we plan to use in our study. Table 2 gives the percentage breakdown of the sample (with completed spells) in each educational category for each of the three years, while a similar analysis for year of birth is contained in Table 3.

A possibly disappointing feature of our data set is that we have a substantial amount of missing data for why the spell ended. A breakdown of the reasons for leaving GWA for each of the three years is given in Table 4. (Again, only completed spells are considered.) In each year, for a majority of spells the reason for termination has been coded as other. For a purely statistical description of duration on GWA, the reason for termination from GWA is irrelevant, and the results from using the full sample would be quite useful for forecasting purposes. On the other hand, those leaving GWA as a result of obtaining employment are closest to our interpretation of time spent in a GWA spell as unem-

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[3] We are currently investigating the amount of time-series variation in these variables.

ployment duration. Thus it would make sense to estimate the model of section 2 both for the full sample and only for those leaving GWA for employment. (We are fortunate to have approximately 2,000 observations in the latter sample.)

Thus we believe our data set should provide quite fruitful ground for research analysis. We have a large number of data points for all spells on GWA and for those individuals leaving GWA for employment. Moreover, by using three years of data, we should have substantial variation in the independent variables.

Table 1

Number of Spells on GWA
by Type of Spell and Year of Spell

Type of Spell	Year of Spell		
	1980	1981	1982
Complete	1943	1757	2898
Incomplete	445	516	693
Total	2388	2273	3591

Table 2

Percentage Distribution of Completed Spell
by Year of Spell and Education*

Years of Education	Year of Spell		
	1980	1981	1982
0-6 years	1.9	1.7	2.2
7 years	1.7	1.4	1.0
8 years	7.3	9.1	7.5
9 years	15.7	16.6	15.5
10 years	30.7	26.9	26.9
11 years	16.5	16.4	17.0
12 years	14.6	16.2	18.1
13 years	2.5	2.8	2.1
Post-secondary	5.3	4.7	6.8
Missing	3.8	4.2	2.7

*Column totals in this and following tables may not sum to 100 because of rounding.

Table 3

Percentage Distribution of Complete Spells by Year and Spell and Year of Birth

Year of Birth	Year of Spell		
	1980	1981	1982
1946	1.4	0.9	0.9
1947	1.2	1.3	1.0
1948	2.0	2.1	1.4
1949	1.9	1.6	1.4
1950	3.0	1.7	2.1
1951	2.6	2.1	2.1
1952	2.9	3.5	2.7
1953	4.4	3.2	2.8
1954	4.4	4.0	3.9
1955	6.1	5.4	4.5
1956	8.2	5.8	4.4
1957	8.8	6.8	5.2
1958	9.4	8.3	6.9
1959	10.4	9.2	9.0
1960	11.4	11.5	10.5
1961	11.3	10.9	12.0
1962	7.0	11.6	11.0
1963	3.4	6.2	9.8
1964	0.5	3.5	6.0
1965	---	0.6	2.2
1966	---	---	0.2

Table 4

Percentage Distribution of Completed Spells by Year of Spell and Reason for Termination

Reason for Termination	Year of Spell		
	1980	1981	1982
Obtained employment	24.9	27.3	24.1
Family benefits	0.1	0.1	0.1
Not lacking a principal family provider	0.4	0.1	0.1
Not looking for work	5.1	4.2	7.5
Unemployment insurance benefits	3.7	3.7	5.2
Assets/Income	.8	.9	2.2
Moved from municipality	3.4	5.2	7.7
Covered under another contract	.9	.6	1.8
Other	60.8	57.9	51.3

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